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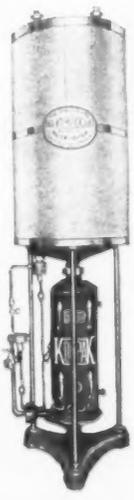

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INDEX TO CONTENTS, PAGE 33

ADVERTISERS' INDEX, PAGE 28

BY-PRODUCT COKE OVENS

The first By-Product Coke Ovens built in America were Semet-Solvay Ovens constructed at Syracuse, New York, in 1892. Beginning with the capacity for coking 110 tons of coal per day, the industry has grown so that today it carbonizes coal at the rate of over 50,000,000 tons per year. The By-Product Coke Industry so essential to the conservation of national resources, has become a vital factor in the commercial development of the United States.

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The Functions of a Safety Committee in a Gas Company Should Not Be Limited

In Order to Accomplish the Best Results the Work of a Committee Should Have the Complete Co-operation of the Management so that Authority Is Given to the Suggestions

By a Special Correspondent

The work of a safety committee of a gas company can be made as extensive or limited as desired by the management but in order that best results be obtained the functions of a committee should take in every branch of activity. Safety committee work has passed out of the fad stage and has shown that it can be productive of real returns if it is allowed to carry on its work to the fullest possible extent.

In undertaking the formation of a safety committee there are numerous steps which will make easy the work and will enable the committee to start producing at once, provided the management is thoroughly in accord with the movement.

Not a "Safety First" Committee

In beginning safety work in a company it is well to eliminate the word "first" from the title of the committee. A "Safety First" committee is naturally limited to spreading instructions on avoiding accidents, whereas a safety committee might well be described as a life and property protection committee as well as a saving organization.

Having decided that a safety committee is an essential part of a company, the first step is the selection and instruction of its members. One company that the writer is familiar with started its safety committee with the heads of the various departments as members. This committee, which consisted of some twelve members, was then divided into subcommittees, each one of these smaller bodies being responsible for the carrying on of the work in a department. In no case was the head of a department placed in charge of the safety work on his own particular bailiwick, but rather the superintendent of distribution was in charge of the work in the manufacturing department, while men from the accounting department undertook the work in the distribution, etc. This had a double effect: In the first place, it made the heads of the different departments keep on their toes in keeping up the standard in their department, and secondly, it made the inspecting head of the subcommittee alert to find laxity in another man's department. It might be said that friction would develop where a man is allowed to inspect another's department, but this is not so. If a man was so keenly sensitive that he felt that the fault which was found was directed at him personally he was quickly informed that this was not the case and he was soon argued out of his foolish stand.

An Interlocking Personnel

When the personnel of the subcommittees was selected, and, by the way, this personnel was interlocking in membership with other committees, the duties of the committees were outlined. At least once a month a tour of inspection of the department under its jurisdiction was to be made and a report carefully prepared. This report was to be submitted to the committee as a whole at its regular monthly meeting.

The subcommittee was held responsible for the condition of the plant. If a department head had become lax in maintaining the orderliness of his department this was to be included in the report but this report must be specific in every direction and must tell exactly wherein a condition was wrong. If defective tools were in use, the tool, if it constituted a hazard, was to be reported to the head of the department at once with a request that it be taken out of service. If a man was awkward in his work or inclined to take chances this also was to be reported to the department manager, but in no case was either the committee chairman or any of its members to give an order to the workman.

The First Tour of Inspection

On the first tour of inspection the list is carefully compiled of conditions that should be remedied, each member setting down for himself everything that came under his observation. This list should be forwarded to the subcommittee chairman who will eliminate the duplications and in turn forward the complete report to the general chairman of the committee.

A second report dealing with the property that had been abandoned or was out of use for any reason also should be prepared. This second list is forwarded to

the property clerk who is in a position to advise the purchasing department regarding the material on hand so that when a requisition comes through a quick glance at the list will show whether the property called for needs to be purchased or whether it can be withdrawn from service in one department and given to another. It might be well to point out here that the saving in this direction alone in a comparatively small company amounted to over $11,000 in one year. It was a revelation to the management when the final reports were submitted.

The Committee Meeting

The various subcommittees having completed their tours of inspection and the reports having gone forward to the general chairman, a meeting of the committee as a whole is called. At this meeting the various reports are read and the heads of the departments involved are given an opportunity to explain why certain conditions exist. The committee then votes on its recommendation to the management or in some cases to the department head. Every item of the reports is discussed fully so that there is no chance of it being overlooked in the work of the committee.

The adding of recommendations to the report serves to remove the possibility of destructive criticism, for if a man has noted a condition he is asked for a remedy and this remedy is applied if it is feasible. Minutes of each one of these meetings should be kept and carefully transcribed so that there can be no part of the work that is not fully covered.

At the conclusion of the meeting it is the duty of the chairman of the committee to divide the recommendations fully and then forward a copy to the department head. Five days is allowed for the carrying out of suggestions. If no report is then returned to the chairman arrangements are made to post a copy of the report in the department involved. It may be said that experience has proved that this report will not remain posted for any great length of time. If the department head ignores it, you may be sure that the members of the department will not and the condition will be changed.

Executives Should Keep in Close Touch

It is necessary, of course, that the executive officers of the company be kept in close touch with the developments that arise in the work of the safety committee and so the management is able to keep complete control of the situation. If the suggestions seem to become radical this can be removed and thus hard feelings averted.

By having the initial committee composed of department heads several objects are accomplished. In the first place, it will provide authority for the carrying out of the safety suggestions and if the department manager is thoroughly alert to his work it will also serve to arouse interest in this important subject in the members of the department. If this is carried out faithfully at the end of the year when a new committee is to be appointed some of the subordinates in the department will be ready and able to take over the lines of the committee and carry on the work.

One of the greatest faults that has been found with the safety work of most companies is the fact that after the first couple of meetings and tours interest dies down and instead of making the tours of inspection, attending the meetings, etc., the members will plead pressure of other work. This can be done away with, however, if when the instructions are first issued it is announced that the management considers this branch of the work as of as much importance as any other regularly assigned duty. Then if there is any failure to carry out the program as outlined the responsibility can be fixed at once and the negligent one brought up with a round turn.

The Value of Prizes

One large gas company offers prizes at various periods throughout the year for the best safety suggestions and it is remarkable the number of responses that are received. In one case the janitor of the main office building by a suggestion won the prize and incidentally saved about $1,500 for the company when his suggestion was put into effect. When a suggestion is adopted, however, announcement should be made and if possible the management should write a formal communication to the one offering the suggestion, making this letter public, so that every employee will be able to see.

In addition to these periodical prizes one large prize covering the year should be offered. The incentive that a cash award has for the average employee is really amazing and never in the memory of the writer has it failed to bring forth numerous responses.

The Results to Be Obtained

The results to be obtained from an alert safety committee, which is the only kind of a committee that is worth establishing, will prove truly surprising. It will serve to reduce the number of accidents that take place in a plant; it will reduce property damage remarkably and it will effect a saving in expenditures that will prove that the time devoted to the work has been profitably interested. As an example, one company in the Middle West, although having only a few thousand meters in operation was able to save $18,000 in twelve months. The time devoted by the safety committee consisted of approximately eight hours each month on the part of nine employees. Here is a direct return with a vengeance, in the opinion of the writer.

No company can afford to overlook this important branch of management, for it will prove more than justified when the returns are all in.

375 Deaths by Gas Due to Leaky Tubing

Accidental gas asphyxiation was the cause of 375 deaths in New York City during the first eleven months of 1920, according to figures compiled by the office of Medical Examiner Norris. A conservative estimate of deaths in December, records for which had not been completed, would be twenty-five.

Of the deaths listed, 168 were in Manhattan, 157 in Brooklyn, 14 in the Bronx, 24 in Queens and 12 in Richmond.

Most of the fatalities, according to George La Brun, compiler of the records, are due to defective rubber tubing attached to gas heaters. Eighty per cent of the deaths occurred in the winter months when heaters are in use.

"More than 50 per cent of these deaths could have been prevented by enactment of an ordinance which would compel the use of reliable tubing," Dr. Norris said.

Efforts of Gas Companies to Secure Genuine Good-Will Not Always Successful*

There Is No Reason Why the Customers Should Not Have High Regard for Utility

By G. I. VINCENT

Engineer, Syracuse Lighting Company

The material in this discussion is taken in part from two committee reports on parallel subjects, one report submitted to the 1919 meeting of the American Gas Association, and another to be submitted to the 1920 meeting, but which it is proposed to publish before the meeting.

It is a reasonably safe assertion, that the efforts of large utilities to secure the genuine good-will of the large majority of their consumers have not been entirely successful. That this has not been universally so in the very small utilities, is also true, and will be discussed later.

Inherently there is no reason why the customers of a public utility should not have for the utility the same regard which they have for the merchant, from whom they purchase their supplies. In fact, the utility should command the good-will of its customers to an even greater extent, because the product is cheap, the delivery instantaneous, quality uniform, and the meters by which the cost is measured, are more accurate than the scales and measures which are used to determine sales of other commodities.

Admitting that this condition exists, it is pertinent before attempting to apply a remedy, to inquire as to the cause. However, on putting the question to a number of competent managers, it was found that opinions varied so widely, or in some cases were absent altogether, that the writer concludes to accept the condition as it is, and inquire if any remedy can be applied.

Comparison of Systems

Let us consider for a moment a comparison between the utility's system and the business of a large department store. This comparison has heretofore been made with respect to one of the utility's activities, usually to the detriment of the utility, and usually quite unfairly. For the sake of establishing a working hypothesis, it will be assumed that the department store has its customers' good-will, because it has examined all its activities from its customers' viewpoint, and this the utility to a large extent does not do.

Accepting this hypothesis for a moment, it will be admitted at once, that it is a comparatively simple matter for the department store to secure the customer's viewpoint, and an equally difficult matter, for the utility to secure it. The reason for this is obvious. The customers of the department store come into intimate contact with the employees when practically every purchase is made. The employee's job depends on making the customer satisfied. The officers and department heads in a large department store are constantly analyzing their business, from the customer's viewpoint, and passing the result of their investigation down to the employees, who come in direct contact with the customer. The accounts of a large department store indicate that their customers come to the store about four times per month. The consumers of a utility, of course, do not average anything like this. The majority of consumers' visits to the office of the utility are to pay bills, and given the very nature of this there is little opportunity for the cultivation of the consumer at this time.

Must Establish Contact

There is, of course, very much more to be said on both sides of this comparison, but only this much will be taken up in order to make the point. The conclusion clearly is that the utility must find some possible way to bring its employees in more frequent contact with its customers, and to take advantage of that contact, by developing to the highest degree the personal element.

"But," says the progressive manager, "we are already giving the very best service. The quality of our gas is uniform, our office employees are courteous, and our trouble men well trained," etc. All of this can be granted, and yet the manager will not by any means have the good-will of his consumers. If he could do all the work in contact with the consumers personally, and was the right kind of a fellow, he would undoubtedly have their good-will, but, of course, this would be utterly impossible in a utility of a large size.

Something About Efficiency

During the last decade, we have been taught that efficiency will be acquired by specialization. Scientific efficiency fundamentally requires the highest degree of specialization, and it has found its way into all the activities of modern and well managed utilities. This may, apparently, make for low costs in our operation, but we are not running a factory. Should we not think of our income, not only as the dollars and cents which are paid to us for our products, but also the intangible income, the high regard of our consumers, which will enable us to conduct our business and secure rates, that will enable us to attract capital, and supply the community to the greatest advantage to all?

It is not asserted that the service, which has been regarded as good service by the utilities, has in all cases been poor. It is simply stated that in most cases the service as given has not been analyzed from the viewpoint of the consumer and has therefore produced little good-will. We must remember that the consumer knows practically nothing about the business of the utility. To him, little mistakes which would scarcely be noticed in the operations of a utility may appear as glaring errors, and stupid or deliberate inefficiency. Do you not know that it is a fact that many consumers who call to give a trouble order do not know that they are one of many, and that it is incredible to them that somebody is not waiting to go out and attend to their difficulties? This, of course, can be remedied by explaining the matter to

*Paper read before Empire State Gas and Electric Association convention.

the consumer in detail, but why not meet the difficulty in another way, by having some one ready to go out on the difficulties immediately? The answer to this, of course, is that it would be prohibitively expensive with present systems.

The Consumer's Viewpoint

To bring the matter right home to us, let us examine two or three of a utility's activities, purely from the consumer's viewpoint. In other words, it will be necessary for us to forget completely all that we know about the operation of our utility.

Assume, then, that you are the consumer, knowing nothing whatever of the business. You receive a bill which you honestly and sincerely believe to be too large You call at the utility's office to protest. You are given a stereotyped line of explanation, but are still unsatisfied. Finally it is agreed that your meter will be tested. In due course you are notified that your meter is correct. Has your regard for the utility increased?

You move to a new location and call to make application for gas and electricity. In due course a man arrives but because of many reasons, for example, errors in the company's records, which makes a turn on, instead of a set, lack of city permit, lack of inspection, or for some one of the many other reasons quite beyond your control, you are left without supply for a day or two or perhaps longer. Has your regard for the utility increased?

You make application for service, and receive it. To the employee who calls at your premises, you indicate a desire for further service. But this employee is a specialist and cannot give it. But in due course, he having reported it back, another specialist arrives. To him you indicate a desire for further service at some other point, but he is also a specialist, and cannot do this. In course of time, all that you want is accomplished, but what is your opinion of the utility and its operation?

You have a laundress at work on your premises, at probably $4 per day and carfare. The washing machine breaks down. You call for service, and are referred to the dealer from whom you purchased the appliance. In the course of two or three weeks the dealer's representative arrives, and puts it in order. What is your opinion of the utility's service?

Four Serious Defects

These could be multiplied but the four are characteristic and will indicate four serious defects in our efforts to give service, and obtain the consumer's good-will.

A lack of knowledge on the part of the employee coming in contact with the consumer, of all the activities of the company.

Incomplete records, or lack of ready reference in the records.

Overspecialization in operations.

Turning over to others business which we should be attending to ourselves.

The first of these needs little comment. Every employee coming in contact with the consumer should not only know thoroughly the business to which he is assigned, but know enough of all the rest of the business, that he can intelligently discuss the matter with the consumer.

The second difficulty is clearly connected with the third, and usually comes from overspecialization. It is entirely possible to so keep the records of a utility, that when a consumer desires service for any reason whatever, the employee waiting on him can tell him more about his premises than he knows himself. By suitable combinations, the operating costs would probably not exceed the present methods after the first installation was paid for.

Result of Overspecialization

Overspecialization has undoubtedly resulted in increased costs, rather than decreased, in a large number of situations. Further, it bothers the consumer and, of course, this we want to avoid. It might be stated that if we desire many contacts between the consumer and the employees that there would be some merit in sending second employees to do each special kind of work. This might be true with the second, or possibly third employee, but when it reaches the tenth or eleventh, and in one actual case, the thirteenth employee, to do something that one employee should have done, it should be perfectly clear that anything but good-will will be secured.

It is essential that all employees coming in contact with the consumer should be constantly trained to use his best efforts to cultivate that consumer's good opinion of him, and of the company.

Small Companies Have Good-Will

Before suggesting that there is a possible remedy for some of the difficulties, it is interesting to take note of the fact that the very small utilities do not suffer from the lack of good-will experienced by the large. By very small is meant in towns of, say, 5,000 population and less. While this is not universally true, it is true in such a large majority of the cases as to be significant. We are justified in assuming that the reason is that the manager or superintendent of the very small utilities and his one or two assistants are so well known to every inhabitant of the community, usually by their first names, that it would be quite out of the question for any self-serving agitator to start anything. Here again we have the personal touch.

Specific Remedy Difficult

In a problem so complicated as this, it is difficult indeed to point out a specific and universal remedy. If, however, our premises are true, the outlook, while not promising, is certaintly not hopeless.

It would appear in the first place that the tendency to go out of the merchandising business by utilities was all wrong. On the contrary, they should go into the merchandising of the appliances using their products and to the maintenance of their appliances to a greater extent than ever before. This business, both the selling and the maintenance, will, of course, take care of itself financially if properly managed. If operated by the utility it should do little more than this. The point is that in selling desirable appliances to their consumers, the utilities have gained a point in favor. By maintenance, this can be carried on indefinitely. But this does not mean the kind of maintenance that has frequently been given heretofore. The maintenance should be practically instantaneous and complete on one visit. To do this would require the training of a corps of high grade workmen, who would be thoroughly familar with all household appliances. Also the meter and trouble

work should be handled by these men. Their equipment should be carefully designed and their transportation built especially to take care of the equipment.

Should Have One District

Each one of these men should be assigned to a particular district in the community and work in it. His equipment being complete for a full day's work, with surplus, it would only be necessary for him to return to his headquarters at the end of his day, keeping in touch in the meantime by telephone, and taking orders. The equipment should include a complete supply of such articles as lamps, fuses, cords, mantles, glassware, and in fact anything that in all normal operation would be required by the domestic consumer.

By keeping the man in one district, it is perfectly obvious that in the course of time he will come to be known by the residents of the district. The utility in turn will come to be known and respected through this one individual and the high-grade and exceedingly prompt service will be cheerfully paid for.

In the general office and salesroom of the utility, the consumer with diversified wants comes in contact with a comparatively large number of employees. It is suggested that this could all be changed, and have one employee assigned to each district, so that when a consumer from that district called at the office, he would see this employee, who would attend to all his wants, from selling to adjusting an account and receiving it. Further, in the general offices of the utility a card index, showing the exact condition of the equipment on every consumer's premises, including finished work and work under way, of all description, together with the credit of the current consumer, etc., would enable the employee representing each district to deal intelligently with practically everything that the consumer would require. It will probably be found that this system will cost no more than any of the present methods when everything is taken into consideration. Here again we have the consumer becoming acquainted with an individual personality.

The Meter Reading Point of Contact

Of course it is realized that we have an employee on every consumer's premises once a month, in our meter readers. Here is a point of contact which, with very few exceptions, has never been used. It is a question whether the meter readers should not be increased in number, and that in addition to reading the meters, they should actually solicit consumer's trouble orders and wants, and also collect the bills, at the time the meter is read.

(*Continued on page* 32.)

U. S. Bureau of Mines Makes Report on Structure in Bituminous Coals

Makes Microscopic Study in Order to Aid in Efficient Utilization of Coal

By REINHARDT THIESSEN

Research Chemist, Bureau of Mines

Conceptions of the origin, composition and general nature of coal held by various scientists in the past are so different and contradictory that it is a difficult matter to determine the real extent of knowledge available, or to rely on the literature. Scientists in general had only a vague idea of the composition of coal, the origin of its constituents, the transformation they have undergone, and the condition they now are in. The chemist did not have enough fundamental knowledge to attack its chemistry in the right directions. The fuel engineer, in turn, did not have a broad enough chemical basis for studies in combustion, distillation, coking, and other processes relating to the use of coals, hence the efficient utilization of coal in the industries suffered from the lack of a proper knowledge of the nature of coal itself.

The Bureau of Mines, in order to clear up some of the confusion that exists and to get a more exact knowledge of the nature of coal in general, as well as to obtain certain fundamental facts, has been conducting at its Pittsburgh station, a microscopic study of the structure of coal.

Method of Examination

One of the great hindrances to the study of coal, from the time of the earliest investigators to the present day, has been the difficulty in preparing thin sections for microscopic observation. Many attempts had been made to overcome this difficulty, and also to devise other means of study. For a number of years the ash method was pursued, bits of coal being either totally or partly burned and the ash examined under the microscope. Later maceration was tried with some success, but on the whole it failed to reveal the true nature of coal. More recently the method was tried of softening the coal with reagents and then cutting it into thin sections with a microtome. But this changes the coal too much to show its true appearance, besides the method is inexpedient.

For the bureau's work an adaptation of the method used successfully for years by petrologists in studying rocks and paleobotanists in studying plants was employed. A small rectangular piece of the coal to be examined was planed and polished on one surface, which was then cemented to a glass slide with a mixture of Canada balsam and marine glue. The piece was ground to a safe thickness on a lapidary's wheel and was finally ground to transparent thinness by hand on a fine hone. Examinations were then made through the microscope at magnifications ranging up to 2,000 diameters. Photomicrographs at the same magnifications were also made.

The Banding of Coal

Even with the naked eye, a bed of any bituminous coal is readily seen to be banded, and a chunk of coal is

seen to be highly laminated and composed of layers varying greatly in thickness and in color, texture and fracture.

There are generally recognized and described two kinds of coal with respect to its texture; compact coal and mineral charcoal or mother-of-coal. In the compact coal, in general, two kinds of bands are recognized, apparently alternating and in sharp contrast. The one is of a bright jet-black, pitchy appearance and breaks with a conchoidal smooth, shiny fracture. The other is grayish black, of a dull appearance, and breaks irregularly. The former is generally called "bright coal" or "glanz coal" and the latter "dull coal" or "matt coal." The bright coal consists of lenticular masses greatly varying in thickness and breadth and entirely surrounded by or embedded in the "dull coal."

The Bright Coal

From the study at high magnifications, it has been definitely shown that the "bright coal" represents constituents that at one time were pieces of wood, as of trunks, stems, branches and roots. They are called "anthraxylon."

The Dull Coal

The "dull coal" is extensively sublaminated into thinner sheets of "bright coal" and "dull coal." These thin sheets of "bright coal" also consist of definite components and are embedded in a dull granular appearing matter. The "dull coal" may, therefore, conveniently be divided into two classes: the thin black shiny strips and the highly comminuted material, termed attritus, in which they are embedded.

It is conclusively shown that the thin strips of bright coal are also derived from woody parts of plants, and are anthraxylon, but represent thinner and smaller fragments than the thicker strips. There is no real distinction between the larger and the smaller or thinner anthraxylon constituents, there being a complete range in intermediate sizes, but the smaller are the more numerous. Some coals are largely made up of the thinner anthraxylon strips.

The Attritus

The attritus is composed of a number of groups or classes of constituents, most of which can be definitely identified and their origin determined. These are the degradation products of cellulose (the essential constituent of cell walls), humic matter, spore exines, resins, remains of cuticles, highly carbonized materials, rodlets, and some mineral matter. All are readily distinguishable in the photomicrographs.

Examination of a number of coals has shown that most of the coal is derived from the woody parts of plants, such as trunks, stems, branches and roots, including all the tissues that make up such parts. Some of this wood is represented by the larger anthraxylon, some by the smaller anthraxylon and some by the attritus. The proportion represented in each of these varies in different coals, and even at different levels in the same coal bed. There is evidence that some of the cellulosic matter is derived from the more delicate tissues, such as herbaceous plants, young or growing parts of plants, leaf tissues, etc.

Humic Matter

The humic or decayed vegetable matter forms a considerable proportion of the attritus of all coals. It is derived from the cellulosic parts of plants, but includes besides macerated semi-decayed wood some macerated gum, bark, pith, cortex and other more delicate parts. There is no sharp dividing line between the anthraxylon and the humic constituents.

Resins

Resins are found in all coals, but in greatly varying proportions, both in the anthraxylon and the attritus. When found in the anthraxylon, the resin is in those tissues where it would be expected if the constituent were still a sound piece of wood. In the attritus the resins are easily distinguished from the other constituents.

Spore Exines

The exines or outer walls of spores are present in the attritus only and form an important part of all coals, but in greatly varying proportions. The spore exines are the most readily discernible constituents in all coals, and have definite characteristics. Different genera and perhaps different species of exines differ in sculpturing, size, form, and thickness of wall, and by means of these characters can readily be distinguished from one another. The spore characters have been so well preserved in almost all coals that the spores of one kind of plants can be clearly distinguished from those of another kind. In some coal seams the larger bulk of the spore exines are of the same kind, in other seams two or three kinds may form the main bulk. In comparing coals from different beds, the predominating exines of one seam are easily seen to be different in some way from those of any other bed. Thus the coals of different beds, containing different spores, may readily be distinguished from one another.

Occasionally in a given coal seam a spore exine is found that differs from those of any other seam but does not predominate. This spore exine may be a distinguishing characteristic of the coal seam in question, although not the predominant one. This fact promises to be of value in the stratigraphic correlation of coal seams. The Pittsburgh seam, for example, contains a small spore exine that is both predominant and characteristic, and may thus be easily distinguished from any other.

Carbonaceous Matter

All ordinary bituminous coals contain certain constituents that are more highly carbonized than the rest of the coal and stand out in sharp contrast to it on account of their opaqueness. In general, there are two types of carbonaceous matter—one type shows definite plant structure and consists of the more highly carbonized parts of plant cells or bits of woody tissues or other plant tissues; the other shows no plant structure and is of indefinite origin.

(*Continued on page* 34.)

Specifications for Gas Fixtures Just Issued by American Gas Association

Committee Consisting of J. P. Conroy, W. R. Knapp, C. A. Luther, W. W. Barnes and Rufus H. Maurer, Chairman, Makes Public Report

Gas fixtures should be of such mechanically good construction that proper installation, operation and maintenance will be assured without encountering any special difficulty.

Care should be exercised in the design of the fixture, so that no portion of it interferes with ready access to any nut, or screw, which it may be necessary to get at for the purpose of adjustment.

Brass pipe or tubing should be either seamless drawn or brazed; in either case of best quality to allow bending and threading without splitting.

The thickness of walls of brass pipe or tubing should not be less than No. 18 B. & S. gauge (0.04030 in.), except when it is used as casing or covering for iron or steel pipe, in which case it should not be less than No 22 B. & S. (0.02534 in). Both of these gauges are subject to the usual gauge tolerance of + or — 0.002 in. Particular attention should be paid to having tubing which runs the full gauge.

Iron or steel pipe should be of the American standard size.

(While No. 18 gauge is very generally in use, it is believed that it is very much better to use No. 17 gauge. This is not because the 18 gauge tubing is not strong or rigid enough, but because when threads are cut on it, there is not sufficient metal to be sure that a good joint is made. If the 18 gauge always ran full size, or a little over size, there would be no objection to it being used, but as it is necessary to allow some variation in the gauge of tubing, it is thought that the No. 17 gauge should be specified.)

Sizes of Threads

All threads on brass tubing should be straight threads to conform to the standard specification of the American Society of Mechanical Engineers, for such threads.

All pipe threads for iron or steel pipe should be the standard iron or steel pipe size. (Briggs standard.)

When brass tube, steel or iron are connected, the thread should be gas fixture size brass tubing thread, on both the brass, steel or iron, but it is recommended that, where possible, instead of connecting the parts in this manner, a brass bushing be used, threaded on the outside with standard I. P. S. thread to screw into the iron body, the bushing being tapped on the inside with a straight gas fixture size brass tubing tap, for the connection of the brass tube.

Assembling Requirements

Joints of the stems or arms at the body should be well threaded and depend on the thread for strength.

All joints connecting tubing to cocks or nozzles should be threaded and brazed.

The threaded portion of pendant body, or manifold, for fixture stem to be of such a depth that in no case will the stem come in contact with the arms. The pendant body should be threaded for at least four full threads, both for the stem and arms, providing it is a light fixture; if of heavy design, then more threads must be allowed.

Fixture arms should not extend into the pendant body, or manifold, for a greater distance than the threaded portion of the manifold.

If the arms of the pendant are straight, then the pendant body, or manifold, should be drilled in such a way that the arms will be perpendicular to the stem.

The burner nozzle, or nipple, to have a ⅛-in. iron or steel pipe, male thread. The length of this threaded portion should be not less than 9/32-in. and not more than 11/32-in., and the bottom of the thread should be recessed so that the burner will make a neat, tight joint, with the finished end of the arm immediately before the threaded portion.

The axis of the burner nozzles should be vertical.

Special precautions should be taken in the construction to prevent the obstruction of the gas-ways by foreign mater, such as gas fitters' cement, solder, or other jointing material, or metal chips. The ends of tubing should be reamed to remove burrs. When duplex tubing is used, care should be exercised to prevent faulty alignment of the gas-ways.

Gas fitters' cement should not be used on any part of the fixture where it may be affected by the heat from the burners. When solder is used, it should be of such a mixture that it will not be affected by the heat from the burners.

Fixtures for use out of doors, or in exposed situations, should be provided with suitable drips, or means for the convenient removal of condensation from any part of the fixture in which such condensation may accumulate. Independent pilot lines in outdoor fixtures should not be smaller than ⅜-in. iron or steel pipe size.

Globe holders should be of such construction and weight that they will properly support, without sagging or bending, any globe, or shade, with which they are intended to be used. They should be readily and rigidly attached to the fixture arm or portable stand, and held in place by screwing down the burner, or by other means. They should provide a good seat for all parts of the globe with which they are supposed to be in contact. Eyelets should be inserted where screws are used for holding the globes, these eyelets to be of such a size that they will provide at least three full threads, and should be brazed to the holder; where tripods are used the arms of the tripod must be brazed to the base.

When a fixture has two cocks at the body, the cocks should be so placed that the keys will be, at all times, at least 1 in. apart in the clear.

Portable shade supports or holders must have at least

(*Continued on page 35.*)

Periodical Meter Testing of Vital Importance to Consumers as Well as to the Gas Company*

A Small Percentage Error in the Total Registration Sometimes Means a Large Difference in the Net Revenue

By F. J. MURMANN

Westchester Lighting Company

Gas is bought by the consumer in much the same way that he buys food, coal or other commodities which are sold according to standard weights and measures. The difference lies only in the fact that gas is invisible and must be measured by means which are not so clearly understood by the general public.

In every well-governed community there is an official whose duty is to test the weights and measures by which general commodities are sold. If the weights and measures are correct, there is no injustice done to buyer or seller. Furthermore, the knowledge that means are being taken to provide accurate measurement instills confidence in the purchaser which eventually benefits the merchant.

On account of the nature of gas and the fact that each consumer must have an individual measuring device, it is natural that the operating company should act as official tester.

Although the method of testing gas meters differs somewhat from that used in testing weights and measures for other commodities, nevertheless the fundamental reasons for testing remain the same.

Meter Testing of Vital Importance

From an economic standpoint, the question of periodical testing of consumers' meters is of vital importance to every gas company since the revenue depends upon the registration of the meters. A variation in accuracy of registration is not attended by a corresponding variation in operating or production costs. A small percentage error in the total registration will sometimes mean a large percentage difference in the net revenue.

Many of the larger companies realize the importance of testing consumers' meters and this work is now a part of the daily routine. There are, however, some companies that lay great stress upon the efficiency of other parts of the system and apparently overlook the inaccuracy of their meters. Progressive companies, by periodical testing, will do their utmost to see that meters retain their ability to register accurately.

Meters operate under more varied and exacting conditions than most other pieces of apparatus, and being mechanical devices, the natural tendency for them is to run slow. In spite of this fact, they are expected to register accurately for comparatively long periods of time with little or no attention.

A company which has done little or no testing should be able to pay the expenses from the saving due to the correction of slow meters. It is a matter of record that the accuracy of meters is more important from the standpoint of the company than it is from the standpoint of the consumer. Companies having thousands of meters in service for a number of years, have found that approximately four times as many meters run slow as run fast. The consumer quite properly protects his interests by insisting upon having his meter tested when he suspects that he is paying for more than he receives. The company having four times as much cause, surely ought to protect its interests by testing its meters.

Another reason for testing meters is one which rarely receives any consideration. There is no doubt of the fact that the continued periodical testing of meters by the companies has done more than any other one thing to stimulate the efforts of the manufacturers to place upon the market a meter which has reached the present standard of merit. If it were not for the fact that accuracy and reliability were the foremost requirements, meters might be sold on a purely commercial basis with the result that the present standard would be lower.

Aside from the previously mentioned reasons there is another one. This is its effect upon the mental attitude of the consumer. It has been pointed out that devices used for measuring gas and electricity are not clearly understood by the general public. It is natural for the public to mistrust that which is not clearly understood. It therefore follows that the operation and accuracy of gas and electric meters is looked upon with suspicion. The periodical testing of meters will do much to maintain the confidence of the consumer and will frequently prevent unjustified high bill complaints.

In this paper, an effort has been made to emphasize the fact that the testing of meters is one of the necessary features of the gas business and it is hoped that a discussion will follow which will be the means of helping gas companies to recognize the importance of periodical meter testing.

*Paper read before Empire State Gas & Electric Association.

Efforts of Gas Companies to Secure Genuine Good-Will Not Always Successful

(*Continued from page 29.*)

To repeat, the whole point of this suggested organization is to bring the consumers in contact with a competent person known to them personally, to the entire satisfaction of the consumer, at frequent intervals. The thought is to get away from the perfunctory attention, that will almost invariably result from overspecialization. If the theory is reasonable it will accomplish two things.

It will increase the sales of our basic products by increasing the sales of appliances.

It will go far to secure the good-will of our consumers, in just the same way that the merchant secures the good-will of his customers.

Just one more point in closing. It is highly probable that the consumer who owns any securities, no matter how little, of the utilities in his town, will at least be steering along the friendly road.

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Contents of This Issue

THE FUNCTIONS OF A SAFETY COMMITTEE IN A GAS COMPANY SHOULD NOT BE LIMITED..... 25

EFFORTS OF GAS COMPANIES TO SECURE GENUINE GOOD-WILL NOT ALWAYS SUCCESSFUL—BY G. I. VINCENT 27

U. S. BUREAU OF MINES MAKES REPORT ON STRUCTURE IN BITUMINOUS COALS—BY REINHARDT THIESSEN 29

SPECIFICATIONS FOR GAS FIXTURES JUST ISSUED BY AMERICAN GAS ASSOCIATION 31

PERIODICAL METER TESTING OF VITAL IMPORTANCE TO CONSUMERS AS WELL AS TO THE GAS COMPANY—BY F. J. MURMANN..... 32

EDITORIALS 33

MERCHANDISING 38

NEWS OF THE GAS INDUSTRY..... 40

As the Journal Views It

Municipal Ownership Again

That there is a persistent propaganda being carried on in favor of municipal ownership is shown by the recent statement issued by a representative of the government of the city of New York in connection with the operation of a small trolley system in that city. Although this road was taken over only a short time ago and in fact has been operated by the city for only three weeks the statement declared that municipal operation had proved successful and that a "nice profit" had been made.

Those who are in a position to know have stated that the city of New York will next attempt to operate all of the light and power companies on Staten Island, which comprises Richmond Borough, basing their action on the fact that the transit line has proved a success under this form of management. This is only part of the gigantic move that is under way throughout the entire United States to get possession of public utilities and as before been stated in these columns this municipal ownership plan calls for the city ownership and operation of gas plants. That is one reason, according to well-informed persons, that gas companies are meeting with such determined opposition in attempting to establish a fair and equitable rate. However, the fact that public opinion has gotten in back of most companies when ruin was foreseen has served notice on those who are seeking to serve their own interests that they must take a new tack in their plans.

According to a confidential source of information which the AMERICAN GAS ENGINEERING JOURNAL has, there will be a determined drive made against any action to establish a new B.t.u. standard, although this is admittedly needed at the present time in the interests of conservation.

It is for gas men generally to take advantage of the information which has been furnished them and to so conduct their business that there can be no alienation of public support which has been won so dearly. If this is done, then there will be no room for municipal ownership and there will be no opportunity for any one to make public utilities another source of jobs for the politically "faithful."

Increased Consumption

Gas company executives are reaching out more and more for means of increasing the winter load but always with the idea that in back of this there will be developed some appliance or device that will serve to maintain the summer load in direct proportion. When a new gas consuming appliance is introduced to the market that will increase the demand during the cold months the far-seeing executive looks at once for its summer equivalent.

With new and more adequate rates being put into effect in various parts of the country, increased consumption will help to restore our industry to its rightful place as the leading public utility.

A New Commission

The announcement that Governor Miller of New York State is planning to place control of public utilities other than traction lines under control of one commission has created a great deal of interest and comment among gas company officials generally, who look forward to a more uniform set of rulings under this plan. At the present time New York State is divided into two districts, each with its own regulatory body. In the past this has created two sets of rulings on the same question and has caused considerable confusion.

One of the important questions to be decided during the coming months has to do with the B.t.u. standard that is to be enforced in New York State. While in numerous other States this question has progressed to a large extent, in New York State it has failed to receive the consideration that it deserves. Now that every effort is being made toward conservation the consideration of a reduction in standard can well be entered into.

Ever since its inception by Governor Hughes the Public Service Commission of New York has never had any clearly defined powers, the authority which it has been able to exercise being in one direction only. It is to be hoped that when the newly formed body takes office that laws granting it real power will be passed so that it will not only be a buffer between municipal authorities and consumers on the one hand and the companies on the other, but will also be a regulatory body in the full sense of the word. But in order that it may accomplish this it will be necessary that much of the legislation now being enforced be cleared off the statute books and a fresh start made. It is certainly to be hoped that a time of sane rulings has come for the industry as a whole.

The Employees' Magazine

Just what is the value of an employees' magazine to a gas company? That is a question that recently came up in a company and after an investigation it was decided by the executives that if the magazine had cost twice the amount expended it would remain a splendid investment. The determining factors were the opinions expressed by the employees themselves who were questioned by the various department heads. Without a single exception every worker in the company declared in favor of the magazine and expressed a hope that it would be continued indefinitely.

In a way the employee magazine serves the same purpose that a magazine devoted to the interests of a trade serves. The publication brings together the interests of the employees, it tells what the other fellow is doing and keeps up the morale of the workers in times of stress. If the magazine is devoted to the interests of the employee and mentions him frequently enough there can be no doubt but that it is serving its purpose, but if, on the other hand, the magazine is devoted to the promulgation of rules and regulations it becomes a handbook of the management and as such has no place in the usual routine of events. By all means, if your company is publishing an employees' magazine, continue it, and if you are contemplating issuing such a booklet be sure to do so, for it will do much to promote good-fellowship in the organization. But the first and only principle of such a publication must be service to the employee, exactly as the cardinal principle of your company must be service to your community.

U. S. Bureau of Mines Makes Report on Structure in Bituminous Coals

(*Continued from page* 30.)

RODLETS

Other constituents that are invariably present in all coals are the so-called rodlets or needles. Many are scattered helter-skelter through the attritus. Sometimes they are present in such large numbers that they form a considerable part of certain thin laminae. Many of the anthraxylon components and, conspicuously, many of the mineral charcoal constituents, inclose a smaller or larger number of rodlets that are evidently part of their structure. Most of the tissues remaining in the coal with which rodlets are associated are recognized to be those of plants related to the Medullosae, well-known Paleozoic plants allied to the Cycads. From this it appears that some of the rodlets, if not all, are the semi-petrified contents of the mucilage canals of Medullosa-like plants. In the original plants, these canals were elongated intercellular spaces containing gummy substances.

Specifications for Gas Fixtures Just Issued by American Gas Association

(*Continued from page* 31.)

three supporting wires which should be brazed and riveted throughout.

A shut-off cock of standard specifications must be placed in the main supply stem of all fixtures including domes, but not portables and brackets; such cock must be independent of the local burner control.

Goose or Stork Neck

The thread on a fixed portion of a goose or stork neck should be not less than 9/32-in. in length and should be threaded with ⅛-in. I. P. S. thread.

The ground joint between the fixed and movable portions should have a bearing surface of not less than 1 in., and the diameter of the small end of the ground joint should not be less than ⅜-in.

The joint should be thoroughly and properly ground and not merely tool finished. It should be perfectly gas tight, without grease, under a pressure of 8 in. water column. The joint may be tested for satisfactory grinding by wiping the plug and body free from grease and putting on the plug a small quantity of dry red lead or chalk. The plug when turned in the body should then show neither high nor low places.

(Note.—A water column 8 in. high is the equivalent of a mercury column 6/10 in. high, and represents a pressure of about one-third of a pound per square inch.)

It should be possible to lock the movable part to the fixed part by a bayonet lock, or approved means.

Casing

Where casing is used it should be cut to an exact length so that the joint may be made up tight, without marring or jambing the parts to the fixture at either end of the casing.

Chain Pulls

Where a by-pass chain passes through a part of the casing, or an ornament of the fixture, the opening through which the chain passes should have an eyelet, or similar means, to prevent the links of the chain from catching on the edges of the opening. If a rod is used in place of a chain, the eyelet may be omitted.

If a chain pull is to be used, a sample of such chain should be submitted for examination and approval.

Cocks on Portable Stands (Floor or Table Type)

A portable stand should not have a cock as part of the stand.

Swing Joints

The committee desires to go on record as being opposed to the use of brackets having any swing joints.

Center Control Cocks

A center control cock, which is the cock used for controlling the supply of gas to a fixture having two or more arms and which may or may not be at the same time a by-pass cock, should have, in all cases, a 3/16-in. gas-way, and in other dimensions should conform with the gas fixture cock specification appended hereto.

If this center control cock has lever arms, these arms should be of sufficient length to permit of easy operation of the cock so that neither the arms, nor the rods, nor the chains, operating the cock, come in contact with the body arms or other parts of the fixture.

Grease

The grease used on cocks, or swing joints, should not contain resin, paraffin or similar substance. When the cocks are exposed to heat, as in the case of a by-pass cock over an inverted incandescent lamp, the grease should be made of a good quality of gas engine cylinder oil and graphite, in proportions of about one pound of graphite to one pint of oil. This grease is also preferred for use with *all* cocks. Where this lubricant is not used, a satisfactory grease is one made of pure beeswax and a good quality of tallow lard, in about the proportion of three parts of beeswax to 2½ parts of tallow or lard. It is recommended that a small quantity of gas engine cylinder oil be added to make the grease thinner.

Sizes of Pipe or Tubing Used in Fixture Stems

	Maximum No. of Lights	When Made of Iron or Steel Pipe		When Made of Brass Tubing	When Made of Brass Chain Gas-Way Both Sides	When Made of Brass Chain Down Center or One Side	Size of Gas-Way Through Cock
		Cased	Uncased				
23 in. and under	1	⅛ in.	¼ in.	⅜ in.	¼ in.	¼ in.	⅛ in.
33 in. and under	2	¼ in.	¼ in.	⅜ in.	¼ in.	⅜ in.	3/16 in.
Over 33 in. and under 42 in.	2	¼ in.	⅜ in.	½ in.	⅜ in.	⅜ in.	3/16 in.
Over 42 in. and under 72 in.	2	⅜ in.	⅜ in.	½ in.	⅜ in.	⅜ in.	3/16 in.
Any length to 42 in.	4	⅜ in.	⅜ in.	½ in.	⅜ in.	⅜ in.	3/16 in.
Any length, 42 to 72 in.	4	⅜ in.	⅜ in.	½ in.	⅜ in.	⅜ in.	⅜ in.
Any length, 42 to 72 in.	7	⅜ in.	½ in.	¾ in.	¾ in.	½ in.	¼ in.
Any length, 42 to 72 in.	12	½ in.	¾ in.	¾ in.	⅜ in.	½ in.	5/16 in.
Any length, 42 to 72 in.	20	¾ in.	1 in.	1 in.	½ in.	⅝ in.	⅜ in.

Note.—When made of duplex tubing the area of the main gas-way should be equivalent to the area of the corresponding brass pipe size in the above table.

Fixtures not covered above or having a drop of more than 6 ft., or having more than 20 lights, use size of pipe according to the company's piping rules.

"Length of Stem" is understood to be the distance in a straight line from the stiff joint to the lowest point of the pendant. In the case of wall brackets, which carry more than one burner, the sizes given in the table are correct, except that no pipe smaller than ¼-in. should be used. In brackets which carry more than one burner, the "Length of Stem" is understood to be the distance from the stiff joint to the point where the arms diverge

Size of pipe or tubing to be used in one-piece or harp pendants:

Number of Lights not Exceeding	Harp (Maximum Size 18x12 in.) Steel or Iron Pipe	Harp (Maximum Size 18x12 in.) Brass Tubing	Stem (Maximum Length 36 in.) Iron or Steel Pipe	Stem (Maximum Length 36 in.) Brass Tubing
1	⅛ in.	⅜ in.	¼ in.	½ in.
3	¼ in.	½ in.	⅜ in.	½ in.
5	⅜ in.	½ in.	⅜ in.	¾ in.

Sizes of Piping or Tubing for Arms

Arms of pendants, or of wall brackets, i. e., those parts which carry gas for only one burner, should be made not smaller than the following sizes:

Length of Arm	When Made of Iron or Steel Pipe Cased	When Made of Iron or Steel Pipe Uncased	When Made of Brass Pipe
12 in. and under	⅛ in.	¼ in.	5/16 in.
Over 12 in. to and including 18 in.	¼ in.	¼ in.	⅜ in.
Over 18 in. to and including 24 in.	⅜ in.	⅜ in.	½ in.
Over 24 in.	⅜ in.	⅜ in.	⅝ in.

Note.—When over 24 in. in length, the arm should be properly supported by some means other than their attachment to the wall outlet in case of a bracket, or the body in case of an arm.

"Length of Arm" is understood to be a distance measured as follows:

In pendants, a straight line from the center of the stem to the center of the burner nozzle.

In stemless wall brackets, like stiff brackets, carrying but one burner, a straight line from the stiff joint to the center of the burner nozzle.

In stemmed wall brackets—a straight line from the point of divergence of the arm to the center of the burner nozzle.

In the case of cast wall brackets or cast arms, the area of the gas-way in stems or arms should not be less than the area of the equivalent pipe, or tubing specified in Section 11, Par. A.

Cocks

All cocks, including arm cocks, center control cocks, lantern cocks, of any other shut-off cock, should be made in accordance with the "Specification for Gas Fixture Cocks." By "shut-off cock" is meant any cock intended to be used for completely shutting off the gas supply to a burner or burners.

Specification for Gas Fixture Cocks

It is not intended that this specification shall in any way govern the design of fixture cocks, except in so far as the dimensions given may govern the size. The accompanying drawing, which is on a large scale, is merely conventional, and is intended to show only the dimensions referred to in the specification.

The material of both plus and body should be free from all defects, and of such grade that constant use will not cause excessive wear.

The end of the plug should have two flat sides for the washer, and two nuts, a main nut and a jamb nut, should be used instead of a tail screw. (Boston type.) The plug and the male thread on the end of the plug should preferably be made of one piece; if made of two pieces, the nipple forming the male thread on the end of the plug should be screwed, and sweated with hard solder, into the plug.

The bearing surface for the washer on the cock body should not be smaller in diameter than the diameter of the washed. The washer should wear evenly on the face of the body.

The plug should stop at 90 deg. in either direction when shut off, but when the cock in question is a main by-pass cock, it may be a quarter-turn cock. The plug should be carefully tool finished, and thoroughly and properly ground. It should never be left in the tool-finished state. The question of thorough grinding is of great importance; and sign of insufficient grinding will lead to the rejection of the cock. The cock should be perfectly gas-tight, without an excess of grease, under a pressure of eight inches of water column, while the plug may be turned by hand.

(The cock may be tested for satisfactory grinding by wiping the plug and body free from grease, and putting on the plug a small quantity of dry red lead, or calk. The plug, when turned in the body, should then show neither high nor low places.)

For turned cocks, the thickness of the body wall at the gas-way should not be less than 3/32 in. For cast cocks, the thickness of the body wall at any point, including the part that forms the miter, should not be less than 3/32 in.

The tapered hole through the body should be recessed at the small end to a diameter at least 0.003 in. larger than the diameter of the small end of the plug; this is done to prevent the formation by wear in grinding of a shoulder in the small end of the tapered hole in the body.

The gas-way through both the body and the plug should be not less than ⅛ in. diameter. The gas-way in the plug should register with the gas-way in the body.

Neither of the two distances provided to take up for wear should be less than 1/32 in.

Neither of the two bearing surfaces on either side of the gas-way should be less than 3/16 in. in length.

The distance provided to take up for wear should not be less than 1/32 in.

The seal between the gas-ways in plug and body, when the key is hard over, should not be less than 3/16 in. in length.

The stop pin should be either screwed or driven into place. If a driven pin is used it should be made of soft annealed metal.

Diameter of the stop pin: If a driven pin, not less than 1/18 in.; if a screwed pin, not less than 3/32 in. No portion of any 1/16-in. diameter pin should extend below the miter, i. e., below the line M. N.

Length of the stop pin should be not less than 1/16 in.

The key and the gas-way should be straight on the axis of the body when gas is on.

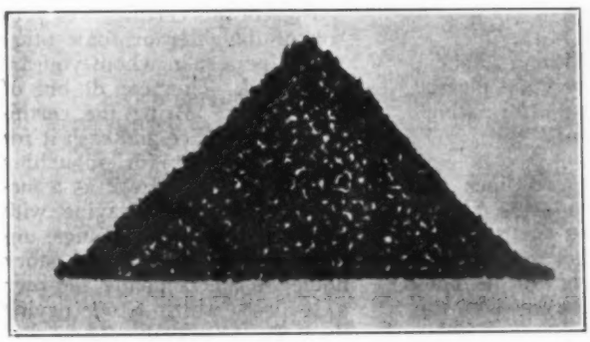
The key and the plug should preferably be formed of one-piece metal; if not, the two pieces should be firmly attached by sweating with hard solder.

The cock body should have at the screw point not less than five full threads.

How Many Tons in a Conical Pile of Anthracite Coal?

Formula Developed Which Will Prove of Aid in Measuring Pile—How the Chart Works

Because of the fact that when anthracite coal is piled loosely on the ground or on a floor it assumes a fairly definite angle of repose, we can easily develop a formula for computing the number of tons in a natural conical pile. The weight of anthracite per cubic foot is a fairly constant quantity also, which makes the development of the formula still easier.



Such a formula has been developed, but it involves squaring the diameter of the base of the pile and multiplying by a constant. To make the method as easy as possible the writer therefore constructed this chart, which gives the tonnage direct by simply glancing across from column A to column B.

For example, how many tons of anthracite coal in a conical pile whose base diameter is 30 ft.?

Find the 30 in column A and glance across to column B and there's the answer—about forty-eight tons.

Inversely, the chart can be used to determine the size of plot needed for the storing of a given amount of anthracite coal.

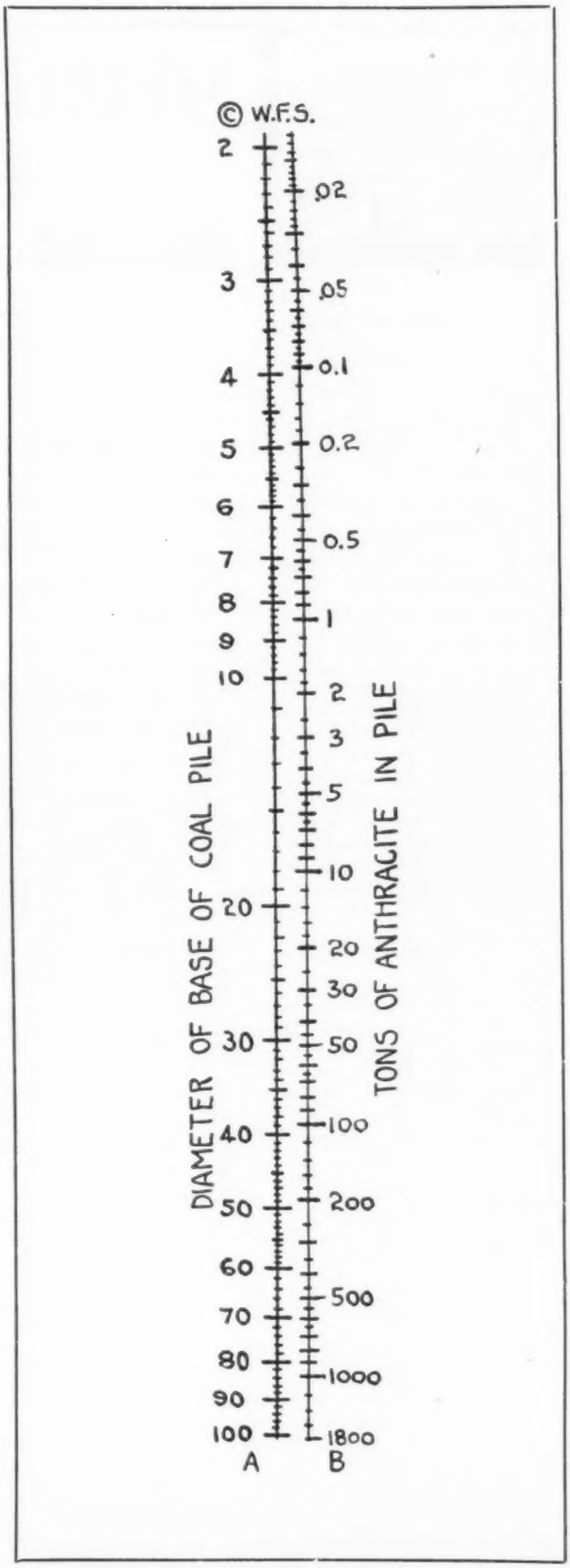
For example, what size of plot will be needed for the storing of 200 tons of anthracite coal?

Find the 200 in column B and glance back to column A. The answer is—about 49 ft.

The range of the chart, it will be noted, is great enough to take care of most ordinary piles. It varies from 2 to 100 ft. in diameter. In a 100-ft. pile there would be about 1,800 tons.

W. F. SCHAPHORST.

(*Copyright*, 1921, *by W. F. Schaphorst*)



Toast With Gas

By W. B. Stoddard

Repetition is bound to increase an effect, and therefore the Citizens Gas & Fuel Company, Terre Haute, Ind., when they set out to advertise their gas toasters, did not simply place a couple of these devices in the window. Instead, they arranged three big pyramids of them in the background while down in front, close to the glass, they placed a whole row of them, each with a crisp piece of toast in it. Cards lettered in blue served to deepen the impression of the desirability of using these gas toasters: "Toast by Radiant Fire heat—browns bread evenly to your liking," and "The gas toaster is the real sanitary toaster—browns bread evenly and does not burn the crust." Red ribbons run from the three pyramids of toasters to the cards.

Gas Stock as a Gift

During the pre-holiday season several of the large gas companies launched campaigns for the giving of gas stock certificates as holiday gifts and the idea is one that could profitably be followed during the spring season for wedding gifts, or in many instances, as anniversary or graduation remembrances. The Southern Illinois Light & Power Company have been sending out post cards, with return card attached, on which they say:

A SUGGESTION FOR A GIFT

What could be more appropriate as a gift to your son or daughter than an investment which would bring its reminder of the Christmas spirit every three months with the arrival of a dividend check. A gift of our preferred stock would do this.

If you could instill an idea of thrift and economy by the gift of a first payment toward a sound investment, it would be the wisest gift you have ever made, and bring the greatest satisfaction.

Such a Present Will Never Wear Out

Detach and mail the card at the bottom of this folder for further information.

On the card at the bottom was printed:

Southern Illinois Light & Power Company,
Litchfield, Ill.

Gentlemen:—Without obligating me in any way please send me complete information regarding your plan.

Below this were two lines with space for name and address. In this way they outlined two separate plans. The giver could either make a present of stock outright, or he could make an initial payment and thus give the recipient a start, and induce him to save his earnings in order to complete the payment. The latter plan would be especially appropriate for a graduation gift, as it would induce the saving habit in a young man on the eve of his entrance into business life. It would be wise, however, to include newspaper advertising as well as card advertising in a campaign, as many who are not at present gas customers would be interested in such a plan—and if they owned or gave away gas stock they would naturally become interested in the fuel itself, and wish to test its conveniences.

The Louisville Gas & Electric Company, Louisville, Ky., is another firm that is advertising gas certificates, and is laying particular stress on the thrift feature of the plan. The campaign has been taking the form of a personal appeal, and the circular sent out is a facsimile of a stock certificate, which when opened reads:

A FIVE-DOLLAR GIFT WITH WONDERFUL POSSIBILITIES

Here is a suggestion for constructive, character-building giving that may appeal to you as a thoughtful man or woman.

You can come to our investment department and by investing $5 procure a saving-investment certificate for a share of our 7 per cent preferred stock, which pays dividends regularly every 90 days and which has an 82-year record of consistent returns to the investor back of it.

Present this certificate to your son or daughter or some other young person in whom you are interested. They can do one of two things: Bring the certificate to our office and cash it for $5 to be spent for something they wish, or utilize it as a medium for systematic saving, with 6 per cent interest earnings, until they are a preferred stock holder in this company and own a security worth $100, paying them $7 a year cash. Their savings may be $5 a month, or as much as they choose.

Starting boys and girls on the straight road to financial independence surely is worth while. Your $5 gift may be the thing that will make them the individuals you would like them to be in years to come.

INVESTMENT DEPARTMENT
Louisville Gas & Electric Company

As in the case of the Illinois gas company, there is no surer way to get people interested in their products than by making an appeal to their pocketbooks, and an extensive publicity campaign for the purchase of gas certificates for birthday, wedding anniversary or graduation presents will be sure not only to increase their sale but to awaken interest in the many gas devices which can be advertised at the same time.

GROCERS' EXPOSITION AT LOUISVILLE

The first annual grocers' exposition, held in the Armory at Louisville, Ky., in December, was devoted to a showing and demonstration of all things good to eat and drink that are sold in a modern grocery. One of the outstanding features was the wide prevalence of gas ranges throughout the different booths, showing that the manufacturers and household efficiency experts realize that it is the very best fuel for baking and cooking of all kinds. Geher & Son furnished the gas ranges for a number of the booths, including the Ballard & Ballard Company, Calumet Baking Powder Company, Foulds Milling Company, Warner Macaroni Company, and most important of all, in the lecture room, where each afternoon Betty Lysle Wilson, a domestic science expert, lectured on the scientific preparation of food. Geher made considerable capital of these ranges, advertising their use in the different booths, and concluding:

> Take particular notice of the
>
> QUICK MEAL GAS RANGES
>
> in active operation in the above mentioned booths. See how excellently they bake and how beautiful their construction, and you will at once realize why they are so popular.

A decidedly attractive booth was maintained by the Gas & Electric Shop, whose booth of white had a roof formed of streamers of twisted purple and white paper and the white posts twined with green vines. Here were shown both gas and electric lamps, gas ranges, gas heaters, and a full line of electric merchandise.

Incidentally, this same Gas & Electric Shop had a very interesting display in the window of its own shop. the background was a fan-shaped arrangement of red and white paper, and the display was floored with white, with a border of red. The lamps, both for table, wall and chandelier were covered with shades of red or white. In the center was a Clark Jewel range with a card, "The better range — at normal prices." Grouped about it were a garage heater, small gas stove, and several types of gas heaters. At one side was a hot water heater, and attached to it was a card, "Ask your neighbor who owns a Hoffman." Inside the store demonstrations were given with the ease of baking on gas, and also the heating powers of a gas heater.

The Merchants Heat & Light Company, Louisville, have adopted a slogan that could well be followed by other firms. Electric signs extending entirely across the front of their building on both streets advise: "Service first; courtesy always." Gas heaters and ranges have been widely exploited in both show windows and newspapers since the cold weather set in. One window showed a gas stove, and down in front a diagram of a gas burner. On this was printed:

> HOW TO ADJUST YOUR RANGE RIGHTLY
>
> See that your gas burner emits a clean blue flame. If the flame has a yellow hue, the air intake is wrong, and you are wasting gas.
>
> This diagram illustrates your burner.
>
> (Then followed full instructions regarding the regulating of the air intake to secure the proper flame.)
>
> "Popping" is usually caused by too much air—have the air and the gas adjustment just right.

This practical little help in the adjustment of the gas burner caused many people to pause and inspect the line of stoves and ranges.

New Automatic Pressure Control Functions Satisfactorily

Drop in pressure in distribution gas lines leading from vaults is prevented by means of an automatic control device worked out by E. A. Luney and C. Henricksen, Jr., of the gas department of the Public Service Company of Northern Illinois. It eliminates hand control of district governors. The device was installed in two of the vaults in the system in Evanston, Ill., two months ago and its results are very satisfactory.

Gas is distributed in that city and also Wilmette and Kenilworth through low pressure mains. There is a five pound line from Niles skirting the western edge of the thickly populated portion of Evanston and then extending east through Wilmette. At certain intervals, gas is fed from this line into the low pressure distribution mains. At the junction of the five pound and low pressure mains there is a concrete vault underground whose purpose is to afford a location for the Reynolds district governors which reduce the five pound pressure to six inch water pressure. The governors are so designed as to maintain the six inch water pressure on the outlet side for any practical range of pressures that might be carried on the high line.

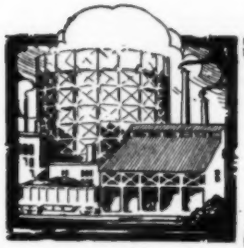
Gas leaves the vaults and finds its way into the mains of the distribution system through twelve inch cast iron pipe. Laterals are taken off and the network of pipes extend throughout almost the entire section east. The demand in the territory is primarily for domestic purposes and this creates three peak loads. One of these—the breakfast load—comes on in the morning. The next is at noon and the third pull in the evening is the supper load. At these periods the requirements of users are greatly increased. In fact, consumption easily becomes great enough to reduce the pressure at remote sections to a large degree insufficient to secure efficiency with ordinary appliances.

The situation is met by increasing the pressure at the outlet of the governor in the vault during the peak load periods. This heretofore has been accomplished by placing small weights on the auxiliary regulator which is a part of the district governor's equipment. The man detailed to do this work is obliged to remain in the vault throughout the continuance of the heavy demand. Obviously as no method is available enabling the consumption to be determined on any particular day the placing of these weights cannot be made an accurate operation.

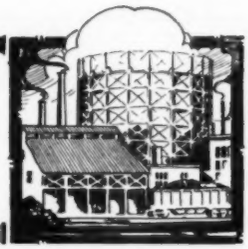
The new automatic contral apparatus referred to which has taken over the work of the man may be broadly described as an attachment extending from the main arm of the governor.

Gas Users Increasing

Due to the fact that electricity is now so largely used for lighting purposes a popular belief seems to have grown up that the gas business as a whole is declining. That this belief is unfounded is shown by the fact that the total amount of gas sold in the United States has increased from approximately 118,000,000,000 cu. ft. in 1908 to more than 300,000,000,000 cu. ft. this year, or an average annual increase of 13 per cent. Gas is now being used to large extent for industrial heating purposes.



NEWS OF THE GAS INDUSTRY



Judge Hough Upholds $1.50 Gas Rate

The existing rate of $1.50 a thousand cubic feet of gas, charged by the Kings County Lighting Company, Brooklyn, N. Y., was upheld by Judge Hough, of the United States District Court, in an opinion filed Jan. 5.

The decision was given at the close of an argument on a motion by the Public Service Commission and the Attorney General to vacate or modify the order and injunction granted in October by Judge Hough, by virtue of which the lighting company was able to raise its rate. Under the injunction, the court held, the existing rate is not inequitable.

Judge Hough declared the 80-cent gas law unconstitutional last October and restrained the commission or the Attorney General from interfering with the new rate, subject to the right of any party making application to have the injunction modified on the ground that the rate was inequitable.

Judge Hough said that the most fortunately located gas companies in that district could not exist on a rate lower than $1.20 per thousand. He said the Kings County Company, because it had to obtain authorization of a $2,000,000 issue of preferred stock to continue its service, could not be considered fortunate.

W. Va. Wins First Skirmish in Steptoe Hearing

West Virginia won the first skirmish at the opening of the hearing on the Steptoe gas case at Charleston, W. Va., when Levi Cook, special commissioner of the United States Supreme Court refused to recognize the objection of Ohio and Pennsylvania counsel to testimony submitted by H. E. Nease, it was declared, was not qualified as an expert on natural gas.

As a result Nease was the only witness examined. He was on the stand during the day and will be recalled at the next hearing. His testimony consisted of detailed annual reports of six of the largest gas companies in West Virginia. These reports were filed, and will be examined minutely by the commission.

Rate Increase to Peoples Gas Light Denied

Gas rates will remain unchanged as the result of a decision of the Illinois Public Utilities Commission denying the petition of the Peoples Gas Light & Coke Company, of Chicago, for a 20 per cent increase. The ruling of the commission makes permanent the present rate of 60 cents for the first 400 cu. ft., $1.15 for each additional 1,000 cu. ft., and $1 a thousand for all over 50,000 cu. ft.

Donald R. Richberg, special counsel for the city in gas litigation, estimated that the immediate saving to gas consumers from the decision was $7,500,000 a year.

The consumers also were benefited indirectly by the part of the commission's ruling which establishes the valuation of the company's property for rate making purposes. This fixed it at $85,000,000. The company had presented figures placing the maximum valuation of the property at $156,000,000 and its minimum worth at $114,000,000. The city had placed the valuation of the gas company's property at $55,000,000.

This decision on the valuation is important, as the commission holds that the company is entitled to earn 7½ per cent on the valuation. The return on the basis of the $85,000,000 valuation will be $6,375,000.

Gas Incorporations

Power Oil & Gas Company, Los Angeles, Cal.; incorporators, John Hodges, Robert Schwarz, Oscar Lampman, Julia M. Baldwin, Louise Rainerson; capital stock, $500,000; subscribed, $5.

The New Gas Company, Spencerville, Ohio; $9,000; I. M. Hess, L. B. Hess, C. Wetherill, L. G. Wetherill, L. W. Wolfe and E. B. Wolfe.

State Has Right to Tax Gas and Oil

Charleston, W. Va.—Contending that under the decision of the West Virginia Supreme Court of Appeals in the case of the Eureka Pipeline Company and the United Fuel Gas Company, the State will have the right to levy the privilege tax of 2 cents per barrel on oil and 1 cent per 1,000 cu. ft. of gas on such oil or gas as originates in the State, and that the tax will amount to between $400,000 and $450,000 per year, making a total of $800,000 for the past two years since the act went into effect, State Tax Commissioner Walter S. Hallanan has made an analysis of the Supreme Court's decision as handed down by Judge Harold A. Ritz to this effect. Mr. Hallanan's analysis as written in a letter concerning this matter follows:

"The effect of this will be to give to the State a tax on practically all of the oil produced in West Virginia which is handled by other pipeline companies. Practically all of the oil is handled by the Eureka Pipeline Company, and the annual tax to be borne by the Eureka Pipeline Company will be approximately $120,000 per year.

"In the United Fuel Gas Company case decided by the court it is held that 11,500,000,000 cu. ft. of the gas sold by the company direct to the consumers within West Virginia is subject to the tax, and that the 7,500,000,000 cu. ft. sold to the Columbia Gas & Electric Company is subject to the tax, although approximately 99 per cent of this amount is transported outside of the State, and that 8,000,000 cu. ft. sold to the Hope Natural Gas Company is subject to the tax, although 67 per cent is transported outside of the State; and that 7,250,000,000 cu. ft. sold to the Pittsburgh & West Virginia Gas Company is subject to the tax, although 88 per cent is transported outside of the State."

H. Foster Bain Is Appointed President of Bureau of Mines

Dr. F. G. Cottrell, Director of the United States Bureau of Mines, on Dec. 31 handed his resignation to the President, through Secretary of the Interior Payne. He leaves the bureau to take up his duties as chairman of the Division of Chemistry and Chemical Technology of the National Research Council.

Dr. Cottrell recommends as his successor H. Foster Bain, of California, whose name was formally presented to the President. In his letter of resignation Dr. Cottrell said:

"I hereby tender you my resignation as director of the Bureau of Mines, to take effect Jan. 1, 1921.

"In so doing may I recall to your mind that, in accepting this position upon the resignation of Director Manning last June, I explained to the Secretary of the Interior that I had previously made all my plans to resign from the position I then occupied as assistant director and to give my undivided attention to the position of Chairman of the Division of Chemistry and Chemical Technology of the National Research Council, which I had accepted as successor to Prof. W. D. Bancroft, who was retiring July 1.

"I accepted appointment as Director of the Bureau of Mines on the understanding with Secretary Payne that I would continue therein until an available successor should be found who was thoroughly acceptable to him and to the mining industry.

"The time having now arrived when Secretary Payne is ready to recommend a successor, I am placing my resignation in his hands for transmittal to you.

"It is with the pleasantest recollections that I look back over my decade of service in various capacities within the bureau, and, as the greater part of this time has fallen within your own administration, it gives me particular pleasure to tell you of the uniform courtesy and high standard of public service which I have always encountered in my contact with both associates and superiors throughout the whole department.

"It would be with very deep feelings of personal regret that I should take the present step were it not that the position in the Research Council will still permit me to co-operate very closely with those particular aspects of the bureau's work for which I feel myself best fitted."

At the same time Secretary Payne handed to the President the appointment of H. Foster Bain, of California, as successor to Dr. Cottrell.

Mr. Bain was educated and trained as a geologist and mining engineer. He was one of Herbert Hoover's assistants in London on the Belgian relief work during the war. Before that he was editor of the *Mining and Scientific Press*, of San Francisco, Cal., and later the editor of the *Mining Magazine*, of London, England. He made some important mining investigations in south and central Africa, and later undertook similar investigations in China. At one time he was a mine operator in Colorado and once was connected with the United States Geological Survey. Subsequently he was the first director of the Geological Survey of Illinois.

For a time during the war Mr. Bain was assistant director of the United States Bureau of Mines, following up production and manufacture of metal products, explosives and other chemical substances for war purposes. At the close of the war Mr. Bain returned to private life.

Mr. Bain was born at Seymour, Ind. Graduating from Moore's Hill College, Indiana, in 1890, he spent two years at Johns Hopkins University and later received his doctor's degree from the University of Chicago. He has been for many years a prominent and active member of the American Institute of Mining and Metallurgical Engineers, the Mining and Metallurgical Society of America and the American Mining Congress.

New Rates Schedule Filed by Gas Company

The Greensboro Gas Company, Pittsburgh, Pa., issued notices that their gas rates will increase, effective January 15, 1921, pursuant to the schedule filed with the Public Service Commission.

The new rate will be 47 cents per 1,000 cu. ft. with a discount of 2 cents per thousand on bills paid on or before the tenth day of the month. The price of gas now is 35 cents per thousand cubic feet.

Gadsden to Address Public Utility Meeting

Philip H. Gadsden, of Philadelphia, president of the American Electric Railway Association and chairman of the emergency committee of the American Gas Association, will be one of the chief speakers at the annual meeting of the Indiana Public Utility Association in Indianapolis January 13. Plans for the meeting are being made by a committee headed by Harry Reid, president of the Interstate Public Service Company. Working with him are Frank Wampler, of the Indiana Bell Telephone Company; Frank Jordan, of the Indianapolis Water Company, and S. E. Mulholland, of the Northern Indiana Gas & Electric Company, Fort Wayne.

Mr. Reid's committee is preparing a list of other speakers that will include national leaders in each phase of the utility business. Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, is president of the Indiana Public Utility Association, and will preside at all sessions, including luncheon and dinner meetings in the Riley Room of the Claypool and a general session in the assembly hall.

"We are adopting a new idea by planning to have our sessions semi-public," said Mr. Henry. "We are asking all utility company operators who attend to bring with them representative men from their communities. We hope to have the list of guests include leaders in public thought from all parts of the State, such as newspaper editors, city and county officials, bankers and business men generally."

Gas Companies Consolidate

The Illinois State Public Utilities Commission has authorized the consolidation of the Lincoln Water & Light Company and the Logan County Gas Company, both of Lincoln, under the name of "The Lincoln Water & Light Company."

The commission has also authorized the issuance of $375,000 of capital stock by the company and $375,000 of 6 per cent first mortgage bonds to be sold at not less than 80 per cent of their fact value.

The consolidation articles of the company were filed with the Secretary of State. The company has $500,000 of capital stock of which the following has been subscribed and paid: Chester Snyder, Easton,

Pa., $353,000; D. W. Snyder, Jr., Bloomington; George F. Coffin, Easton, Pa., A. B. Beadle, North Hartford, Conn.; F. C. Miller, Easton, Pa., have each $1,000 worth of stock.

A. B. Beadle is president of the company and Chester Snyder, secretary.

Rate Increases Not Sufficient to Meet Increased Cost of Raw Materials

The so-called deflation movement has so far failed to exert any influence upon the cost of materials entering into the manufacture of artificial gas. Coal and oil, the principal raw materials, are purchased under contracts, and have not yet reflected the declining price tendency that is shown in other commodities.

Statistics of a group of twenty-five gas companies operating in fourteen States indicate that the increase in average revenue per thousand cubic feet of gas from 1914 to 1920 was only 24 cents, while over the same period the increase in average cost of oil, coal and coke was over 36 cents per thousand cubic feet, thus giving an increase in cost for manufacturing materials more than 12 cents in excess of the increase in average revenue per thousand cubic feet. The increased rates granted to these companies have been insufficient to meet the increased cost of raw materials alone. Other costs, including labor, entering into the distribution and delivery of the gas to the consumer's premises swell the total increased cost to 44½ cents per thousand cubic feet in 1920 over the average cost of 1914, making the total increased cost at the burner 20½ cents in excess of the increase in average revenue. The average net income per thousand cubic feet in 1920 is 18 cents under the average for 1914.

About 700 of the 1,000 or more artificial gas companies operating in the United States have been granted increases in the rates that they were permitted to charge in 1916, but many of these are not permanent and others have been inadequate in amount to insure profitable operation. There is one favorable development, however, in the fact that the public as well as the regulatory bodies better understand the situation now than at the time when the need for increased rates first became necessary.

Utilizing Surplus Heat of Gas in Enameling and Other Processes

Employment of heat developed by gas fuel in further uses after it has performed its primary purpose, is provided for in a plan being worked out by Engineers of the Industrial Gas Department of the Public Service Company of Northern Illinois in a plant in the western territory where gas from the company's mains runs enameling furnaces. The scheme it is expected will have the effect of reducing the flue gases—that is the unused heat—to about one-quarter of the quantity thus disposed of. The resultant savings will considerably decrease costs in all the processes involved.

The gas burning furnace in this plant was installed early in the year replacing a coal burning device. The construction of the new furnace differed materially from the design of the old one. It has no inner partitions. Gas under five pounds pressure is introduced at an upper corner and its flame is allowed to fill the whole chamber. An intense heat is quickly created. In fact the quality known as radiant heat is realized by this burning of a large quantity of gas in a small space. When a pyrometer indicates the requisite heat degree is established, a system of control automatically shuts off the gas supply. In operation it has been ascertained that the percentage of heat developed by gas which in this furnace is diverted to the work of enameling is five times greater than the amount available for that purpose when coal is the fuel. A great deal of heat remains after each "run" of enameling and it is to put this to useful work that the plan referred to was formed.

The mechanical details provide first for a boiler adjacent to the enameling furnace. The surplus heat will, as it leaves the latter, be conducted to this boiler where it will raise steam for various purposes in the plant. There will still be heat remaining after the boiler is served and this will be sent to the drying room. It is not doubted that similar assignments can be made of unused heat in other processes where gas is the fuel burned.

There are a number of enameling establishments in the territory and all of them have adopted gas as fuel in this operation, substituting it for the other fuels thought for many years to be alone capable of meeting needs. In every case gas has demonstrated in practice its superiority and also the possibilities of greater economy in manufacturing methods. Several of these concerns have increased their facilities and are planning further expansion to meet growth. Their gas fuel scheme has suggested plans of other concerns in other States.

A. G. A. Plans Campaigns for 1921

The American Gas Association's plans for the ensuing year include an energetic continuance of its propaganda of gas as fuel in the industries. The publicity campaign carried out in 1920 had the effect of acquainting many interests with the superiority of gas over other combustibles with corresponding results on the demand made on companies manufacturing it.

It is understood that meeting of various sections of the association will be held early in the year. At these the various plans will be put in concrete form.

79-Cent Gas Rate Suspended

The city council of Detroit, Mich., decided, on motion of Councilman James Vernor, to rescind its action fixing the cost of gas at a flat rate of 79 cents a thousand feet, when H. B. Abell, consulting engineer of the Detroit City Gas Company, said that his company, under this rate, could not raise the $75,000,000 it planned to use for extensions over a five-year period.

The rate will now revert to the sliding scale in effect at present. The action is interpreted as opening the doors to the company to ask the council to grant a higher rate.

Mr. Abell said the outstanding obligations of the company, $1,000,000 in bills payable, could not be met had the company accepted the council's resolution which incorporated a provision that the company spend $75,000,000 for extensions. He also said that if the company is not granted at least a 79-cent flat rate it would be immediately "necessary to discontinue the selling and disposal of gas."

WILLIAM J. HIGGINS, aged 45 years, vice-president and general manager of the Ohio Cities Gas Company, died suddenly in his office in Pittsburgh, Pa., on Dec. 22.

Sliding Scale Issue of Boston Gas Rate Controversy

The recent discussion before the Massachusetts Department of Public Utilities concerning the granting of an increase in rates to the Boston Consolidated Gas Company brings up again the subject of the sliding scale, which is peculiar to Massachusetts as a method for fixing prices for gas, and its relation to increasing and diminishing dividends. It is a question of vital importance to investors in the holding organization, known as the Massachusetts Gas Companies, for in the past few years the Boston Consolidated Gas Company has been contributing about one-third of the entire income of this holding trust. At present the Boston Consolidated, practically all of whose stock is held by the Massachusetts Gas Companies, is paying 7 per cent in dividends, amounting to $1,058,723, as compared with the entire income of $3,375,532 of the Massachusetts Gas Company. The question as to whether the Boston Consolidated will return after a time to a 9 per cent basis and add $300,000 additional to the income of the holding company is of great importance even to such an opulent concern as the Massachusetts Gas.

The Sliding Scale

The matter of increasing and diminishing dividends is dependent upon the principle of the sliding scale. Whether this is a thoroughly practical plan that has done such good service as to justify its continuance is, of course, a mooted question. In theory the principle is as follows:

A standard price of gas is established and a standard rate of dividends. Both the price and the rate of dividends are intended to be fixed on such a basis as to secure justice to consumers and an adequate return on the money invested in the business. In Boston the standard price for gas was fixed by an act of the Legislature of 1906 at 90 cents per thousand cubic feet. The standard rate of dividends was fixed at 7 per cent. For every reduction of 5 cents in the price of gas the company was permitted to increase its dividend rate 1 per cent, this increase to occur in the following year.

After ten years' time—that is, after 1916 had come—upon the petion of the company or upon petition of the Mayor, the Board of Gas and Electric Light Commissioners, to whose work the Department of Public Utilities has succeeded, have the authority to raise or lower the standard price of gas to such an extent as may justly be required by reason of greater or less burdens imposed upon the company, by reason of improved methods in the art of manufacture, by reason of changes in the prices of material or labor, or by reason of changes in other conditions affecting the general cost of manufacture and distribution of gas.

The idea behind all this is that the same incentive which works for increased dividends will also work for lower gas prices. History has borne out this remarkably, for during the ten years of operation the price of gas was twice reduced—on July 1, 1906, to 85 cents and on July 1, 1907, to 80 cents. At the same time the rate of dividents was increased from 7 per cent to 9 per cent. The sliding scale may therefore be said to be well adapted for stable times. With prices of the basic materials and labor used in the manufacture and distribution of gas at a reasonably steady plane, the plan worked out admirably. But rising costs and a stationary standard rate began presently to cause hardships for the company. It was this factor that caused the reduction in rate of dividends from 9 to 7 per cent, where they now rest, although in one recent year, as little as 6½ per cent was paid.

Finally, when the war came on, it became necessary to ask for an increase in the standard price of gas, and a dollar per thousand cubic feet was approved by the Board of Gas & Electric Light Commissioners on Oct. 21, 1918. Since then, though further advances have been necessary, the uncertain conditions attending our entrance into the war have caused the commission to move slowly in setting a standard price for gas. On April 7, 1920, and on July 23, 1920, when the Department of Public Utilities was again called upon to settle a price for gas, it did not attempt to definitely determine a standard price, but named the prices of $1.10 and $1.35, respectively, in order to provide "temporary relief," pending final determination of the standard price after further investigation.

It was at this juncture that an outside organization of chemists was called in to determine a standard price. At the time when the company was receiving $1.10 for gas, this organization found that the actual cost of manufacture of the product was $1.114. However, before this information was obtained, the commission had again granted a temporary increase to $1.35 per thousand cubic feet. Now the company is asking before the commission that a standard price be set.

Standard Price Objections

To this proposal Arthur D. Hill, corporation counsel for the city of Boston, objects, on the ground that these are abnormal times, whereas, the setting of a standard price presupposes stable times. Although it seems evident that the peak of prices has been reached, and that there will be a decrease in costs now, nobody can tell at this time just how far this readjustment will go, in the next six months. It is for this reason that a delay in setting a standard price is petitioned for by the city. In other words, it has seemed not improbable that, to the opponents with a standard price set at $1.50, and the cost of labor and material going down appreciably, the dividends on the stock might easily rise through the operation of the sliding scale system, to 9 per cent once more, and then even to 13 or 14 per cent per annum, a very favorable factor from the viewpoint of the investor.

The answer from the point of view of the company to this important aspect of the question is given by Mr. Wrightington, vice-president. It is his claim that the cost of manufacture of gas will actually have a tendency to rise, within the next two or three years. At the present time, the company has very attractive and profitable contracts with the New England Coal & Coke Company, another subsidiary of Massachusetts Gas Companies. When these contracts expire in 1922 it is his opinion that they cannot be duplicated at so low a figure. For instance, the price of coal under these contracts to the Boston company is only $9 a ton. When this contract runs out it would be a safe assumption to estimate that as much as $12 might be paid for this item. Again, there is a contract calling for oil at 6 cents a gallon. Here, also, there will be an added cost, upon expiration of contract, of 100 per cent.

Relative to the labor situation, the vice-president of the company claims that there can be no change of any marked degree in the next few years. Unlike the textile and manufacturing businesses in general, there can be no shutdown in the Boston consolidated Gas Company, while it fights out conclusions with its help. Considering this factor, it cannot be hoped that new help can be employed at lower figures than at present. The pipe lines must be maintained; replacement of equipment must go on; and an office force must be retained. No general reduction can take place in labor and guarantee the public good service at the same time.

It is further claimed by the vice-president of the company that there can be no hope for an increase in dividends in the immediate future. The act of 1906, governing the sliding scale, definitely states that the company must show, for a period of at least one year, actual operation at a cost below the standard price, before any increase in dividends can take place. Inasmuch as this year must date from June until the following June, such being the company's fiscal year, it is evident that if a standard rate of $1.50 is adopted at this time and an actual reduction in cost of the manufacture of gas takes place in the near future, no benefit can be derived from the point of view of the investor until July, 1922. It is for this reason officials of the company suggest, that although $1.50 is granted as the standard price at the present time, the company will not necessarily charge this price to the consumer.

Leaving aside, for the moment, the consumer's point of view, a standard price is urged by the company in order to make the stock an attractive purchase to investors. Authority to increase the rate is asked, so that the corporation may be in a position to continue paying the present dividends, and not be obliged to use earnings for extensions, that are fairly chargeable to capital account. New construction is planned, and new equipment must be purchased. However, this phase of the question is answered by Mr. Hill, who states that the Boston Consolidated Gas Company does not know, nor can it ever ascertain, whether its stock is attractive to the public, as it is practically entirely held by the Massachusetts Gas Companies.

Whether the times are suitable for setting a standard rate of $1.50; whether the State can afford to take the chance of entering a binding contract; whether reverting to the sliding scale principle (in discard, virtually, since 1916) is feasible, are the questions which the Massachusetts Department of Public Utilities must settle, a question of vital importance not only to the consumer but also the investor in Massachusetts gas companies.

Gas Company Charters Filed

Central Texas Pipeline Company, of Brownwood; $1,000,000. W. A. Leston, H. H. Barrett, Brownwood; S. A. Boorstin, Tulsa, Okla.

Brownwood Gas Company, of Brownwood; $350,000. W. A. Leston, H. H. Barrett, Brownwood; S. A. Boorstin, Tulsa, Okla.

Stephenville Gas Company, of Stephenville; $150,000. W. A. Leston, H. H. Barrett, Brownwood; S. A. Boorstin, Tulsa, Okla.

Dublin Gas Company, of Dublin; $100,000. W. A. Leston, H. H. Barrett, Brownwood; S. A. Boorstin, Tulsa, Okla.

De Leon Gas Company, of De Leon; $80,000. W. A. Leston, H. H. Barrett, Brownwood; S. A. Boorstin, Tulsa, Okla.

Comanche Gas Company, of Comanche; $150,000. W. A. Leston, H. H. Barrett, Brownwood; S. A. Boorstin, Tulsa, Okla.

Nova Scotia-Texas Petroleum Company, of Dallas; $20,000. W. E. Welbourne, W. C. Miller and David W. Hardy, all of Dallas.

The Whaley Cove Oil Company, of Liberty; $100,000; C. G. Baggett, A. H. Waldmon, Baston; N. Waldmon, Beaumont.

La Grange Farmers Oil & Gas Company, of La Grange; $50,000. Lad V. Vanck, Otto E. Eckel, Charles Eckel, all of La Grange.

Bond Issue Approved

The proposal of the Cincinnati Gas & Electric Company, Cincinnati, Ohio, to authorize an issue of $50,000,000 in prior lien and refunding mortgage bonds running forty years, with sinking fund provisions, has been approved by the company's stockholders.

The bonds will be issued at such times as the company's financial needs require and will bear such interest as the market conditions at the time of sale call for. Of the $50,000,000 issue $15,000,000 is set aside to refund present outstanding note issues.

Frank L. Cross, Gas Company Manager, Dead

Frank L. Cross, general manager of the Detroit City Gas Company, Detroit, Mich., died in Harper Hospital on Dec. 27 of sleeping sickness. Mr. Cross had been suffering from the malady for about six weeks.

According to Dr. Hugo A. Freund, president of the department of health, and Mr. Cross' physician, the disease is a little more prevalent now than it has been. Dr. Freund declares that there were quite a number of cases a year ago, but the number abated for a while.

Mr. Cross was born in 1880 and came to Detroit from the University of Michigan. He entered the employ of the gas company and in time attained the rank of superintendent of distribution. He left here in 1910 and went to Madison, Wis., as general manager of the gas company there.

Seven years later he went to St. Paul, where for three years he was vice-president and general manager of the St. Paul Gas & Electric Company. Jan. 1, 1920, he returned to Detroit as general manager of the local gas company.

Mr. Cross was a member of Palestine Lodge, F. & A. M., of the Fellowcraft, Kiwanis and the Masonic Country Clubs.

Extra Gas Dividend Declared

In these days of dividend reductions and omissions any company which increases disbursements is bound to attract attention. This is what the American Ice Company and the Columbia Gas & Electric Company, of West Virginia, have done by the declaration of extra dividends of $1 a share on their respective common stocks. In the case of American Ice the action came quite unexpectedly, although earnings have been reported to be running satisfactorily. It was only a year ago this month that American Ice resumed dividends on its common stock at the rate of $4 annually after the lapse of seventeen years without a payment. The dividend is payable Jan. 25 to stock of record Jan. 12. The Columbia Gas & Electric extra dividend had been expected, due to the company's high earnings. It is payable Jan. 25 to stock of record Jan. 10. After the meeting of directors it was announced that net earnings for 1920 will exceed $5,000,000, or more than 10 per cent on the stock.